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ABSTRACT

This document consists of a sample curriculum model for grade 6 mathematics based on the 1998 Arkansas State Mathematics Framework. The document is divided into five sections: (1) Number Sense, Properties, and Operations; (2) Geometry and Spatial Sense; (3) Measurement; (4) Data Analysis, Statistics, and Probability; and (5) Patterns, Algebra, and Function. Within each section the standards are exemplified and articulated by benchmarks, suggested assessments, and possible strategies and activities for teaching the standard. (MM)

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SAMPLE CURRICULUM MODEL

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Grade 6

based on the 1998 Arkansas State Mathematics Framework
Arkansas Department of Education, 1998

SE040849

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Grade Level_6_

NUMBER SENSE, PROPERTIES, AND OPERATIONS

Standard NPO.1.0	Benchmarks	Assessments	Strategies/Activities
SLE NPO.1.1 Identify numerical patterns (e.g., prime numbers, squares, exponents) and verify results (e.g., by continuing the pattern).	**Students will identify numerical patterns with one variable such as exponential numbers (e.g., find the next three numbers in this pattern: 4, 16, 64, ___, ___, ___) and prime numbers (e.g., find the next three numbers in this pattern: 13, 17, 19, ___, ___, ___) and will identify numerical patterns with two variables such as row by column in a rectangular grid and will verify results (e.g., continuing the pattern).**	. Teacher made test . State-wide tests . Perform-ance . Writing	. Students are given two extensions of a sequence or pattern. They are to determine if one or both are correct or incorrect. They record their justification and reasoning in their journal. . Read: Math for Smarty Pants by Marilyn Burns.

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NUMBER SENSE, PROPERTIES, AND OPERATIONS

Standard NPO.1.0	Benchmarks	Assessments	Strategies/Activities
SLE NPO.1.2 Expand number sense through the use of mental computation, calculators/ technology, and written and verbal communication (e.g., powers of ten, factoring, greatest common factors, least common multiples).	Students will expand number sense by; mentally multiply by powers of ten up to 10^3; using the front-end estimation technique (e.g., 132 +45 is approximately equal to 100 + 40 = 140, therefore, the answer will be greater than 140); using expanded notation as a mental computation technique; rounding to the nearest thousandth in a decimal based on the context of the problem; finding the factors of a number; finding the greatest common factor (GCF) and the least common multiple (LCM); recognizing fractions equivalent to common decimals and percents (e.g., 1/4 = .25 = 25% or 0.5 = $\frac{1}{2}$ = 50%); solving word problems using calculators/technology as learning tools; oral and/or written communication of reasoning for results of computations; use a scoring guide to perform self-evaluation.	. Teacher made test . State-wide tests . Writing . Performance	. Students are given local sales papers or catalogs. They are to compare the price of the same item in three different locations. They are to use at least two methods of determining the best buy. The students record in their journal the processes and rationales used to reach their conclusion. . Read: Number Mysteries by Cyril and Dympna Hayes.

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NUMBER SENSE, PROPERTIES, AND OPERATIONS

Standard NPO.1.0	Benchmarks	Assessments	Strategies/Activities
SLE NPO.1.3 Represent numbers and operations in a variety of equivalent forms (including models, tree diagrams, and symbols).	Students will: find and represent the prime factorization of a number using a variety of forms (i.e., tree diagrams, stair steps, etc.); represent a quantity using mixed numbers and improper fractions; represent any quantity as a fraction, decimal, and/or percent; represent a fraction as division.	. Teacher made test . State-wide tests . Perform-ance . Writing	. Students will use pattern blocks to represent a mixed number and its equivalent improper fraction. Example: if 2 trapezoids = 1 hexagon, then 3 trapezoids = 3/2 hexagons or 1 $\frac{1}{2}$ hexagons.
SLE NPO.1.4 Consistently demonstrate competence with rational number computations (add, subtract, multiply, and divide) with and without manipulatives and technology.	Students will: divide numbers with a decimal in the divisor and the dividend (e.g., \$4.25 ÷ \$0.50 = 8.5); add and subtract fractions without like denominators; multiply fractions and decimals using manipulatives, pictures, and technology to develop the concepts symbolically; use appropriate technology (i.e., software, calculators with fraction capabilities, etc.) To explore rational number computations.	. Teacher made test . State-wide tests . Demon-stration . Perform-ance	. Students will model multiplying fractions using paper folding. Example: $\frac{1}{2}$ x 3/4 is the same as $\frac{1}{2}$ of 3/4 of a sheet of paper. The paper is folded to represent 3/4. The students then fold the 3/4 in half in order to find $\frac{1}{2}$ of 3/4.

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NUMBER SENSE, PROPERTIES, AND OPERATIONS

Standard NPO.1.0	Benchmarks	Assessments	Strategies/Activities
SLE NPO.1.5 Communicate knowledge of elementary number theory concepts (e.g., primes, factors, multiples, divisibility rules) through classroom interaction and written responses (e.g., tests, journals).	Students will communicate knowledge of: place value to the nearest thousandth in a decimal; prime and composite numbers; least common multiple (LCM); greatest common factor (GCF); divisibility rules for 3 and 6; equivalent fractions; comparing and ordering fractions, including mixed numbers; the operations on fractions and decimals through classroom interaction (e.g., performance assessments, response to verbal questions, etc.) and written responses (e.g., response to open-ended questions, journals, etc.); use a scoring guide to perform self-evaluations.	. Teacher made test . State-wide tests . Writing . Exhibit-ion	. Students will play the "Factor Game". Each pair of students is given a laminated 5x6 grid with the numbers 1-30 sequentially placed in the grid. Each set of students has two colors of erasable markers. The first student circles a number on the grid. The second student, with a different color marker, circles the factors of the number. The students take turns doing this until the numbers left on the grid have no factors other than the ones previously circled. (Each number may be circled only once.) The sum of the numbers in each color is found. The student identified by the color with the largest sum wins. The students continue to play and develop strategies, such as, the largest prime numbers should be circled first so that one player gets only one or no points. Best strategies are recorded in a "Hint" book.

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NUMBER SENSE, PROPERTIES, AND OPERATIONS

Standard NPO.1.0	Benchmarks	Assessments	Strategies/Activities
SLE NPO.1.6 Identify, with/without the aid of technology, irrational numbers and locate irrational numbers relative to other numbers (e.g., the square root of 2 is between 1 and 2, pi is between 3 and 4).	Students will identify, with and without the aid of technology, pi as an irrational number and locate pi relative to other numbers (e.g., pi is a little bit more than the number 3).	. State-wide test . Demon-stration . Observ-ation	. Given string, rulers, and various representations of circles (Can tops, etc.), students determine the circumference and diameter of each circle. The results are recorded in a table. The students determine a pattern by studying the results (the circumference is a little more than three times the diameter). The concept of pi is introduced as being the differing amount of a little more than three.

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NUMBER SENSE, PROPERTIES, AND OPERATIONS

Standard NPO.2.0	Benchmarks	Assessments	Strategies/Activities
SLE NPO.2.1 Use estimation to check the reasonableness of computation in application problems.	Students will use estimation techniques (i.e., front-end estimation, rounding, etc.) to check the reasonableness of computed answers to real-life problems (e.g., the amount of a tip, sales tax on items, total of purchase, discount, money needed to purchase a group of items, etc.).	. Teacher made test . State-wide test . Perfor-mance . Writing	. See NPO.1.6. The students estimate to find that the circumference is approximately 3 times the diameter. The students measure the diameter of a given object and estimate the circumference using the previously obtained information.
SLE NPO.2.2 Develop strategies for comparing quantities using ratios and proportions (e.g., fractions, rates, unit rates, percents, scales) with use of manipulatives and technology.	Students will write missing terms in proportions, express ratios as fractions in simplest form, and find a unit rate with the use of manipulatives and technology.	. Teacher observation . State-wide test . Teacher-made test . Demon-stration	. Students examine various spinners to determine the theoretical probability (ratio of favorable outcomes to whole possible outcomes). The theoretical probabilities are written as fractions in simplest form.

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NUMBER SENSE, PROPERTIES, AND OPERATIONS

Standard NPO.2.0	Benchmarks	Assessments	Strategies/Activities
SLE NPO.2.3 Determine the most appropriate notational representation of a number for the given problem (e.g., fractions vs. decimals, scientific notation).	Students will determine the most appropriate notational representation of a number for the given problem (e.g.,fractions vs. decimals vs. percents, prime factors, expanded notation, rounding to significant digit, etc.)	. Teacher made test . State-wide test . Writing . Perform-ance	. Extend NPO.1.6 to have the students determine which notational representation would be most appropriate for the determined measures.
SLE NPO.2.4 Explain the relationship of numbers in one- and two-dimensional graphs (e.g., number lines and coordinate graphs), with and without appropriate technology such as graphing calculators.	Students will explain the relationship of numbers on number lines (fractions and decimals), coordinate graphs with positive numbers, and double bar graphs with and without appropriate technology such as graphing calculators.	. Teacher made test . State-wide test . Demon-stration . Writing	. Given a set of related points on a coordinate graph, students will explain the relationship of the x value to the y value.

Grade Level 6

NUMBER SENSE, PROPERTIES, AND OPERATIONS

Standard NPO.2.0	Benchmarks	Assessments	Strategies/Activities
SLE NPO.2.5 Communicate using appropriate vocabulary as it relates to the real number system in real-world situations (e.g., integers, whole, rational, irrational, natural/counting, etc.).	Students will communicate in written or verbal form using appropriate vocabulary as it relates to the real number system in real-world situations (e.g., whole, natural/counting, rational, etc.); use a scoring guide to perform self-evaluations.	. State-wide tests . Writing . Teacher made test . Portfolio	. See NPO.1.2, GS.2.1, and GS.2.2 . Extend NPO.1.6 to have the students record the pattern in their math journals. . Extend GS.1.2 to record the rationale/process for determining the answer.

Grade Level 6

GEOMETRY AND SPATIAL SENSE

Standard GS.1.0	Benchmarks	Assessments	Strategies/Activities
SLE GS.1.1 Identify, draw, classify, and compare geometric figures and their relationships in one, two, and three dimensions (from points to *polyhedra*) with physical materials.	Students will identify, draw, classify, and compare geometric figures and their relationships in one, two, and three dimensions (e.g., parallel lines, angles, basic polygons by number of sides and angles, rectangular solid, pyramid, prisms with varying bases, etc.) with physical materials.	. Teacher made test . State-wide test . Perform-ance . Writing	. Given geoboards (string may be substituted), students work in groups to create shapes based on clues highlighting the concepts of parallel, equilateral, and angle measure. Example: Teacher says make an equilateral shape with more than three sides and no parallel sides.
SLE GS.1.2 Apply geometric properties and formulas (e.g., triangles have 180 degrees, opposite sides of rectangles are equal, Pythagorean theorem) to solve problems with and without appropriate technologies..	Students will apply geometric properties and formulas (e.g., perimeter formula, area formula, circumference formula for a circle, characteristics of basic polygons, etc.) to solve problems with and without appropriate technologies.	. Teacher made test . State-wide test . Demon-stration . Writing	. Students determine the amount of wall paper needed to paper a room. (Subtract windows of various shapes and doors.) An additional activity could consist of the students calculating how much border or base board would be needed.

Grade Level 6

GEOMETRY AND SPATIAL SENSE

Standard GS.1.0	Benchmarks	Assessments	Strategies/Activities
SLE GS.1.3 Make predictions based on transformations of geometric figures in problem-solving situations (e.g., compare 2 pictures and determine what changes were made, i.e. flip, slide, rotation).	Students will make predictions based on transformations of geometric figures in problem-solving situations (e.g.,comparing views of buildings, drawing geometric solids, etc.)	. Teacher made test . Log . State-wide test . Exhibition	. Students form various polygons using string and bodies. The students predict, record, and explain the change in the polygon after each transformation. For example: Three students are holding the corners of a triangle which they have formed with string. They predict, record, and explain what the triangle would look like and what they would do to model a flip.
SLE GS.1.4 Establish and apply geometric relationships through informal reasoning (e.g., estimate angle measures).	Students will establish and apply geometric relationships through informal reasoning (e.g., estimate congruency, symmetry, area and perimeter) with and without physical materials.	. Observation . Teacher made test . State-wide test . Demonstration	. The students draw various geometric shapes on grid paper. They then estimate the perimeter and area of each shape. The perimeter and area are determined by student invented strategies. The students explain or demonstrate their invented strategy.

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GEOMETRY AND SPATIAL SENSE

Standard GS.1.0	Benchmarks	Assessments	Strategies/Activities
SLE GS.1.5 Visualize, model, and represent 3 dimensional objects (e.g., cube models, base plans/nets, building plans, isometric dot paper sketches) to develop and implement problem-solving strategies and verify solutions.	Students will visualize, model and represent 3 dimensional objects (e.g., using isometric drawings to show 3 dimensional structures on paper and using orthogonal drawings to show three views (top, front, right) of related isometric drawings) to develop and implement problem-solving strategies and verify solutions.	. Exhibition . State-wide test . Teacher made test . Project	. Students are given various solids. They write four clues describing the geometric solid (one must be an orthogonal drawing showing the top, front, and right views). The clues are exchanged and the students draw the solid on isometric grid paper. Students verify the conclusion.

Grade Level 6

GEOMETRY AND SPATIAL SENSE

Standard GS.2.0	Benchmarks	Assessments	Strategies/Activities
SLE GS.2.1 Construct geometric models to solve problems (e.g., comparing bridge supports: cylindrical vs. rectangular).	Students will use knowledge of polygonal and polyhedral properties to build a structure suited to a set of criteria or to a situation.	. Teacher made test . State-wide test . Exhibit-ion . Demon-stration	. Students construct a house for a windy climate. The house and the written reasoning for the chosen design are exhibited.
SLE GS.2.2 Investigate geometric properties and use them to describe and explain situations in society and nature (e.g., why doors are rectangular, why honeycombs are hexagonal, why trusses are triangular).	Students will describe the properties of triangles and quadrilaterals and explain why those shapes are suited to particular uses in structures and nature (e.g., shape of doors, trusses, tripods, spider webs, etc.)	. Teacher made test . State-wide test . Writing . Project	. Students investigate through construction which tower base (triangle or quadrilateral) lends itself to the tallest height. The students record their decision and the rationale for the decision in their math journals.

Grade Level 6
MEASUREMENT

Standard M.1.0	Benchmarks	Assessments	Strategies/Activities
SLE M.1.1 Use estimation to check the reasonableness of measurements obtained from use of various instruments (including angle measures).	Students will estimate before measuring length, area, and angle measures to check for reasonableness of measures obtained from using various measuring instruments (e.g., rulers, yard and/or meter sticks, protractors, etc.).	. Teacher made test . State-wide test . Perform-ance . Observa-tion	. Extend GS.1.2 to have students estimate the amount of wall paper needed before actually calculating the amount. . Read: Making Metric Measurements by Neil Ardley.
SLE M.1.2 Estimate, calculate, and compare the one, two, and three dimensional features of objects in metric, customary and non-standard units of measure.	Students will calculate and compare areas of objects with the same perimeter. Students will calculate and compare perimeters of objects of the same area. Students will be able to obtain accurate measurements by estimating to the nearest half-inch, centimeter, quarter-inch, and millimeter for small objects.	. Teacher observation . State-wide test . Demon-stration . Teacher made test	. Extend GS.1.1 by having students create the shapes that have various perimeters and areas. They can determine how many shapes can be made with a specified perimeter or area. . Read: Area by Jane Jonas Srivastava.

Grade Level 6

MEASUREMENT

Standard M.1.0	Benchmarks	Assessments	Strategies/Activities
SLE M.1.3 Convert from one measurement to another within the same system (customary or metric).	Students will convert between millimeters, centimeters, decimeters, and meters and between inches, feet, and yards when needed in the context of the situation.	. State-wide tests . Perfor-mance . Teacher made test . Observ-ation	. Extend M.1.1 to have the students convert the amount of wall paper needed from one unit of measure to another within the same system. For example: The measurements are made in inches due to the measuring tool available. The wall paper is sold in yards. Therefore a conversion is required from inches to yards.

Grade Level 6

MEASUREMENT

Standard M.2.0	Benchmarks	Assessments	Strategies/Activities
SLE M.2.1 Select appropriate units and tools (metric, customary and non-standard) to measure to the required degree of accuracy.	**Students will choose the appropriate measuring tool (rulers, yard stick, meter stick, balance scale, clock, thermometer, weight scale, and protractor) and unit (metric, customary and non-standard) to make linear, area, and other specified measurements to the required degree of accuracy.**	. State-wide test . Demon-stration . Project . Teacher-made test	. Extend GS.1.2 to allow the students to choose the appropriate measuring tool and unit to measure to the required degree of accuracy.

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MEASUREMENT

Standard M.3.0	Benchmarks	Assessments	Strategies/Activities
SLE M.3.1 Develop and use procedures to solve measurement problems using one, two, and three dimensions.	Students will develop and use strategies to determine the area of regular and non-regular objects.	. Teacher made test . State-wide test . Demon-stration . Writing	. See M.1.2
SLE M.3.2 Using manipulatives and technology, develop the concepts of rate of change (mph, interest, tax rates, commissions, utility rates) and indirect measurements (heights of an object, width of a river).	Students will use manipulatives and technology to develop the concepts of rate of change (sales tax rates, commissions, mph) and indirect measurements that can be determined by ratio and proportion.	. Teacher observation . State-wide test . Perfor-mance . Teacher made test	. Students race toy cars along a measured distance. The time it takes the car to go from the starting line to the finish line is recorded. Students calculate the rate/speed of the cars using the collected information. (Suggestion: in order to measure the true rate/speed of the cars, they need to be released from the top of a ramp/slope. Pushing them alters the true rate/speed.) Technology: use a graphing calculator, CBL, and motion detector to compare results.

Grade Level 6

MEASUREMENT

Standard M.3.0	Benchmarks	Assessments	Strategies/Activities
SLE M.3.3 Construct scale drawings (using various tools) and/or build 3-D models to represent real-world problems and situations.	**Students will construct scale drawings (e.g., drawing maps to scale).**	. Teacher made test . State-wide test . Project . Exhibit-ion	. Extend GS.2.1 to require the house to be constructed to scale.

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DATA ANALYSIS, STATISTICS AND PROBABILITY

Standard · DSP.1.0	Benchmarks	Assessments	Strategies/Activities
SLE DSP.1.1 Actively and systematically collect, organize and describe data using technology when appropriate.	Students will collect categorical or numerical data and organize the data so that it makes sense to others, using technology when appropriate.	. Teacher made test . Performance . State-wide test . Writing	. Students work in pairs to measure specified features (girth, neck length, height, arm length, etc.) of each other. The class compiles their measurements and organizes the data in a user friendly manner. Suggestion: DSP.1.1, DSP.1.2, and DSP.1.3 could be used in studying the work of forensic experts.
SLE DSP.1.2 Construct, read and interpret tables, charts and graphs (including stem-and-leaf, histogram, bar graph, pie graph, box and whiskers, line graph, scatter plots) with and without technology.	Students will construct, read and interpret tables, charts, line graphs, stem-and-leaf plots, bar graphs, and pie graphs.	. State-wide test . Project . Writing . Demonstration	. Extend DSP.1.1 to have the students work in small groups to construct a graph of the collected data. (Encourage the construction of different types of graphs.) The students read, interpret, and record the interpretation of their classmates graphs.

Grade Level 6

DATA ANALYSIS, STATISTICS AND PROBABILITY

Standard DSP.1.0	Benchmarks	Assessments	Strategies/Activities
SLE DSP.1.3 Based on analysis of central tendencies (mean, median, mode, range) make predictions and inferences (e.g., interpolate from within graphs and extrapolate by extending graphs) from the data set with and without technology.	**Students will compute the mode, median, and mean for a set of numerical data and explain what those measures tell about the data.**	. Teacher made test . State-wide test . Demon-stration . Writing	. Extend DSP.1.1 and DSP.1.2 to have the students calculate and explain the mode, median, and mean for the collected data. The students record in writing the results of the calculations and the explanation of what those measures tell about the data.

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DATA ANALYSIS, STATISTICS AND PROBABILITY

Standard DSP.2.0	Benchmarks	Assessment	Strategies/Activities
SLE DSP.2.1 Conduct experiments or simulations, with and without technology, to model situations and construct *sample spaces.*	Students will determine experimental probabilities using sampling activities, with and without technology.	. Log/ journal . Performance . Project	. Twelve cubes of three different colors are placed in a bag. (The students are not told the number of cubes or the color of the cubes.) A student blindly draws a cube from the bag, identifies the color, and replaces the cube in the bag. This is repeated by each student. A record of the cube colors is kept. After every student has drawn, the students predict the number of cubes for each color that the bag contains. The predictions are recorded. The bag is then emptied and the actual number is determined and compared to the predicted number.
SLE DSP.2.2 Make predictions based on experimental and theoretical probabilities.	Students will tell the likelihood of an event occurring based on experimental and theoretical probabilities.	. Teacher observation . State-wide test . Writing . Teacher made test	. Students determine the likelihood of rolling "snake eyes" (double ones) using dice. They record their rationale in their math journals. . Read: Do You Wanna Bet? Your Chance to Find Out about Probability, Jean Cushman

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DATA ANALYSIS, STATISTICS AND PROBABILITY

Standard DSP.2.0	Benchmarks	Assessment	Strategies/Activities
SLE DSP.2.3 Use a probability model for comparing experimental results with theoretical expectations.	Students will compare experimental results with theoretical expectations (e.g., theoretical expectation to flip heads on a dime is $\frac{1}{2}$, but experimental result may vary).	. State-wide tests . Exhibition . Observation . Writing	. See DSP.2.2
SLE DSP.2.4 Interpret experimental and theoretical probabilities to determine whether outcomes are equally likely or biased.	Students will determine whether games are "fair" or biased.	. State-wide test . Writing . Teacher made test	. Students are grouped by pairs and are given a coin per pair. Student A receives a point if the coin comes up heads three consecutive times. Student B gets a point if the coin does not come up heads three consecutive times. The students determine if this is fair. The process for determining the answer and the rationale for the answer is recorded.

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DATA ANALYSIS, STATISTICS AND PROBABILITY

Standard DSP.3.0	Benchmarks	Assessment	Strategies/Activities
SLE DSP.3.1 Evaluate arguments that are based on statistical data.	Students will determine the truth or validity of statements that claim to be based on a set of data.	. State-wide tests . Writing . Teacher made test . Performance	. See DSP.1.3, DSP.2.2, and DSP.2.4
SLE DSP.3.2 Make inferences and convincing arguments based on statistics with and without technology.	Students will make decisions and influence the decisions of others based on a set of data.	. Teacher observation . State-wide test . Teacher made test . Demonstration	. See DSP.3.1

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DATA ANALYSIS, STATISTICS AND PROBABILITY

Standard DSP.3.0	Benchmarks	Assessment	Strategies/Activities
SLE DSP.3.3 Model the use of probability and statistical methods in decision making using technology presentation materials (e.g., LCD, graphing calculators, spreadsheets, etc.).	**Students will use probability and statistical methods to collect and analyze data to make sound decisions (e.g., recording and analyzing the results of repeatedly flipping a coin); present results using appropriate technology.**	. State-wide tests . Project . Demon-stration . Exhibi-tion	. See DSP.3.1

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PATTERNS, ALGEBRA AND FUNCTION

Standard PAF.1.0	Benchmarks	Assessments	Strategies/Activities
SLE PAF.1.1 Represent arithmetic as algebra (change 25 = __ + 13 to 25 = m + 13).	Students will use a variable to represent an unknown in problems involving simple arithmetic.	. Teacher made test . State-wide test . Demon-stration . Perfor-mance	. Extend M.1.3 to have students use variables during their conversion computations. . Extend M.3.2 to have students use variable during their computations.
SLE PAF.1.2 Through the use of manipulatives and computer technology, develop the concepts of variables, expressions, and equations (algebra tiles, two color counters, graphing calculators, balance scale model, etc.).	Students will use manipulatives (e.g., algebra tiles, two color counters, balance scale model) and appropriate technology (handheld and computer) to develop linear expressions and equations.	. Teacher observation . State-wide test . Demon-stration . Log	. Students use a hundreds chart as a visual. They mark and record the first 6 even numbers. They let x equal the first even number. They write algebraic expressions for each of the remaining 5 identified even numbers. They investigate the pattern and extend it by representing the next 2 even numbers algebraically. The students predict the algebraic representations for the first 5 odd numbers. They record their predictions in their math journal. The students test their predictions and record their process and results in their math journals.

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PATTERNS, ALGEBRA AND FUNCTION

Standard PAF.1.0	Benchmarks	Assessments	Strategies/Activities
SLE PAF.1.3 Analyze and represent (through calculator use) situations and number patterns with tables, graphs, and equations (e.g., identifying linear, exponential, and quadratic patterns).	Students will analyze and represent, with and without calculator, situations and number patterns with tables and graphs.	. Teacher observation . State-wide test . Demon-stration . Exhibit-ion	. Extend NPO.1.1 to have the students analyze and represent each pattern with a table. . See DSP.1.2
SLE PAF.1.4 Summarize and pose problems/situations relating to the algebraic relationships, patterns, and functions, discovered through explorations.	Students will summarize and pose alternate problems/situations relating to algebraic relationships (e.g., linear equations) and patterns discovered through explorations.	. Teacher made test . State-wide test . Writing . Portfolio	. Extend PAF.1.2 to have the students pose an alternate pattern for the even numbers. (For example, the traditional pattern for even numbers is x, x+2, x+4, etc. An alternate pattern, for evens only, could be x, x+x, x+2x, x+3x, etc.) Students record their alternate pattern and the procedure they used to derive it in their math journals.

Grade Level 6

PATTERNS, ALGEBRA AND FUNCTION

Standard PAF.2.0	Benchmarks	Assessments	Strategies/Activities
SLE PAF.2.1 Conduct informal investigations (with technology) for analyzing, representing, interpreting, and generalizing functional relationships (e.g., distance and time) to develop explanations or predictions about outcomes of actual situations.	**Students will conduct informal investigations (with or without appropriate technology) to identify unknowns/variables.**	. State-wide test . Performance . Writing . Project	. See NPO.1.6, GS.1.2, GS.1.4, M.3.2, DSP.1.3, and DSP.2.2

Grade Level 6

PATTERNS, ALGEBRA AND FUNCTION

Standard PAF.2.0	Benchmarks	Assessments	Strategies/Activities
SLE PAF.2.2 Identify variables and relationships and translate them into mathematical statements or other mathematics representations to construct a model (e.g., converting from graphs, tables, words, and expressions).	Given a problem or situations, students will construct a model (e.g., converting from graphs, tables, words and expressions) to generalize a pattern and communicate the rule.	. Teacher made test . State-wide test . Exhibit-ion . Writing	. Students are given a situation. They use a table to model the situation. They translate the situation into words. (For example, students are given one triangular pattern block. They are told to use other triangular pattern blocks to build a figure with twice the perimeter of the single block. They repeat the doubling of the perimeter. They record the perimeter and area as they proceed through the activity. The students construct a model of the pattern and translate it into words. A log is kept of the process. Students determine the area and perimeter of the figure formed if the activity is repeated 2 more times. The process and results are kept in the students' logs. (This can be repeated with other shapes.)

Grade Level 6

PATTERNS, ALGEBRA AND FUNCTION

Standard PAF.2.0	Benchmarks	Assessments	Strategies/Activities
SLE PAF.2.3 Write and solve equations and inequalities (using manipulatives and technology).	Students will write and solve simple linear equations (using manipulatives and appropriate technology).	. Teacher observation . State-wide test . Teacher made test . Performance	. Students use an algebra balance to solve simple linear equations.
SLE PAF.2.4 Communicate in written and verbal form a verification of the solution and the process used to obtain the solution.	Students will communicate in written (e.g., journals, open-ended assessments, etc.) and verbal forms the justification of the solutions and the process used to obtain the solution (e.g., "How do you know your solution is the best choice?"); use a scoring guide to perform self-evaluations.	. State-wide test . Demonstration . Writing . Portfolio	. See PAF.1.2, PAF.1.4, PAF.2.2, and PAF.2.5 . Extend PAF.2.3 to have the students record their process of solving the equation and their justification of the solution in their math journals.

Grade Level 6

PATTERNS, ALGEBRA AND FUNCTIONS

Standard PAF.2.0	Benchmarks	Assessments	Strategies/Activities
SLE PAF.2.5 Use a calculator to display, to determine, and to make inferences from linear relationships in slope-intercept form.	**Students will use manipulatives and/or appropriate handheld graphing calculators to develop the concept of slope.**	**. Teacher observation . State-wide tests . Demon-stration . Teacher made test**	**. Extend M.3.2 to have the students adjust the slope of the ramp. They record the angle of the ramp and the time it takes the car to cross the finish line for each adjustment. They determine the angle of the ramp that gives optimum time for the car. The students record the process and rationale in their math journals.**

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